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March 16, 2009

AGENDA ITEM 5c

TO: MEMBERS OF THE INVESTMENT COMMITTEE

I. SUBJECT: Risk Management Update

II. PROGRAM: Total Fund

III. RECOMMENDATION: Information

IV. ANALYSIS:

Introduction

Risk management is an integral part of the investment decision-making process. In a multi-asset portfolio this begins with the asset allocation decision and cascades down to the asset class level and then to the individual portfolios and securities. An effective risk management program must monitor risk at these many levels:

- Asset allocation is a key risk management decision where the objective is to select optimal portfolios that maximize return for a preferred level of risk, or similarly, minimize risk for a preferred level of return. The implementation of the portfolio relative to the policy benchmark is within a risk budget for allocation deviations and asset class active risks. Currently the active risk budget for the Total Fund is 1.5 which includes 0.75 active risk for active allocations, i.e. asset class deviations from policy targets.
- Active risk budget for asset classes relative to their benchmark based on the investment strategies and portfolio construction. These include risk factor and sector exposures as well as other criteria. Currently there is no specific active risk target at the asset class level.
- Risk parameters for individual portfolios within asset classes primarily relate to factor/sector and individual security exposures.
- Broad risk measures across the Total Fund including leverage, concentration, credit, liquidity and stress testing.

- Quantitative risk measures are helpful but should not be relied upon wholly. Qualitative judgments are equally, if not more important in investment decisions.

The function of the Risk Unit is to identify, monitor, and report these many risk measures to ensure robust risk management across the Fund and to avoid unintended risks.

Background

This is the third risk management review provided to the Investment Committee since staff initiated this report in August 2008. A significant increase in both realized and forecasted market risk has occurred in the recent quarter reflecting the surge in volatility in the financial markets.

The CalPERS Risk Measurement System (RMS) is currently forecasting Total Fund risk of over 17% (standard deviation), more than double from a year ago. This forecast is based on trends in historical returns over extended time periods, and the model is more sensitive to recent returns and volatility in the public markets. The rate of monthly increases in forecasted market risk during the last quarter is the highest experienced since CalPERS incorporated its risk model in 2001.

CalPERS Forecast Total Risk (Attachment 1)

This report shows forecast total risk for each asset class and the Total Fund. RMS forecasts total risk over the next year for the portfolio holdings and benchmark holdings. Since we reported last quarter, projected volatility for the Total Fund has increased nearly 70%, from 10.6% to 17.2%. This volatility suggests, with 2/3 probability, that the Total Fund actual return for 2009 will fall within a range of + or – 17.2% around the expected return. RMS also forecasts a Value at Risk (VaR) at different timeframes and confidence intervals. For example, over a 10 day period, RMS forecasts with 99% likelihood that the decline in the Total Fund value will not exceed $16 billion.

The graph shows both time series history of RMS forecast risk for the Total Fund portfolio looking one year into the future and realized risk based on actual returns for the same one-year period. The portfolio risk forecasts are based on a snapshot of the holdings at that particular time. For example, the portfolio risk forecast of 17.2% is based on the holdings as of December 31, 2008. The future realized portfolio risk as of December 31, 2008 will be based on the subsequent twelve months of Total Fund returns. As of December 31, 2007 the twelve month forecast risk was approximately 8% while the realized risk for the twelve months through December 2008 was 15%. This increase in realized risk is the result of both higher volatility within each asset class and higher correlations between the asset classes.

In this period of extreme market stress, nearly all securities declined in value and correlations increased dramatically. In this case, Total Fund diversification was less effective in cushioning overall portfolio losses.

Asset Allocation and Total Fund Tracking Error (Attachments 2 and 3)

These reports summarize the components of the Total Fund tracking error. Tracking error arises from two active management decisions: asset allocation at the asset class level, and security and sector selection within asset classes. Asset class actual allocations, target allocations and differences are summarized in Attachment 2. The December 31, 2008 forecast tracking error due to asset allocation is 320 basis points. This measure has increased substantially (200 basis points) in the last quarter, because the asset class under and over weights have widened significantly. For instance, the Global Equity underweight increased from 5% to 14%, nearly triple. The total risk of the actual and target asset allocations is shown in Attachment 3. The forecast values indicate that CalPERS actual asset allocation is expected to reduce Total Fund volatility to a level of 16.2%. If instead the fund were to be invested in line with the target asset allocation the expected volatility of returns would be nearly 18%.

Lastly, security/sector selection and asset allocation active risk are combined to produce a forecast of Total Fund tracking error, as shown in Attachment 2. This measure is 182 basis points. This is a 50% increase over the Total Fund tracking error of 120 basis points reported last quarter. The actual portfolio tracking error is lower than the asset allocation tracking error forecast because security selection within the asset classes offsets some of the tracking error from asset allocation decisions. The actual portfolio contains equity securities or proxies to equity factors, within asset classes in addition to Global Equity. For example, forestland and infrastructure holdings are modeled as equity securities in the portfolio but as CPI in the benchmark. As a result, these asset types serve to offset some of the Global Equity underweight.

The graph in Attachment 2 shows that both forecast and realized Total Fund tracking error have increased, more so for realized tracking error. Realized tracking error is higher primarily because of the recent active returns in AIM and Real Estate. The most recent realized Total Fund tracking error value of 270 basis points is based on the twelve months of active returns from January 2008 through December 2008.

Additional Efforts

The above risk analyses have focused on market risk. The function of the Risk Unit, however, is to monitor risk at the many different levels to provide a comprehensive view of risk and to highlight those measures which are most relevant in the prevailing market environment. Risk measures designed to augment market risk are summarized in Attachment 4. The Risk Unit's plan for implementing this program, including a new risk policy, is summarized in Attachment 5.

V. STRATEGIC PLAN:

Goal VIII, Manage the risk and volatility of assets and liabilities to assure that sufficient funds are available, first, to pay benefits and, second, to minimize and stabilize contributions.

VI. RESULTS/COSTS:

This item provides information to the Investment Committee members on the assets and performance of the fund. There are no additional costs associated with this agenda.

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